ORIE 5380, CS 5727: Optimization Methods
Homework Assignment 5
Due October 25, 12:00 pm

Question 1

In the attached text file, you will find data for a network. The first line in the file shows the number of nodes and the number of arcs in the network. Thus, there are a total of 8 nodes and 16 arcs. We label the nodes 1 through 8. Each line in the rest of the file corresponds to an arc. In each line, the first entry corresponds to the origin node of the arc. The second entry corresponds to the destination node of the arc. The third entry corresponds to the length/cost of the arc. For example, the second line in the file corresponds to an arc from node 1 to node 2 with a length/cost of 1. The last line in the file corresponds to an arc from node 7 to node 8 with a length/cost of 6.

Write a program in Python or in another programming language of your choice that calls Gurobi to find the shortest path from node 1 to node 8 in this network. You can hard-code the data into your program. (Starting next week, we will work on more involved programs where you will need to read the data from a file, but you do not need to worry about this issue this week.) You can create all of the decision variables and constraints one by one, without using loops. (Again, starting next week, we will work on larger linear programs where you will need to create the decision variables and constraints through loops.) Your program should solve the linear program corresponding to the shortest path problem, get the optimal solution and print the optimal solution and the optimal objective value, all in Python or in another programming language of your choice. Submit a printout of your code and the output from your code.